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VENABLE LLP			GODBOLD, DOUGLAS	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/812,000	NAKAGAWA, TETSUJI	
	Examiner	Art Unit	
	Douglas C. Godbold	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 30 March 2004.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 30 March 2004 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>20040330</u> .	5) <input type="checkbox"/> Notice of Informal Patent Application
	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

1. This office action is in response to application 10/812,000 filed March 30, 2004.

Claims 1-20 are pending in the application and have been examined.

Priority

2. This application claims priority to Japanese application 2003-154625 filed on May 30, 2003. This priority date has been considered in this office action.

Information Disclosure Statement

3. The Information Disclosure Statement filed March 30, 2004 has been accepted and considered in this office action.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 20 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 20 attempts to claim a machine-readable medium. However a machine-readable medium can be interpreted as merely a magnetic carrier wave, something that is considered to be non-statutory subject matter. Therefore claim 20 is rejected as being non-statutory under 35 U.S.C. 101.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1, 13, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagata (A Stochastic Japanese Morphological Analyzer Using a Forward-DP Backward-A N-Best Search Algorithm).

7. Consider claim 1, Nagata teaches a morphological analyzer comprising (Japanese morphological analyzer, abstract):

a hypothesis generator for applying a prescribed method of morphological analysis to a text and generating one or more hypotheses as candidate results of the morphological analysis, each hypothesis being a word string with part-of-speech tags, the part-of-speech tags including form information for parts of speech having forms (We propose a novel search strategy for getting the N best morphological analysis hypotheses for the input sentence; page 201, column 1, line 35. We used tile simple tri-POS model as the tagging model for Japanese; page 201, column 1, line 30.);

a model storage facility storing information for a plurality of part-of-speech n-gram models, at least one of the part-of-speech n-gram models including information about the forms of the parts of speech (We used tile simple tri-POS model as the

tagging model for Japanese; page 201, column 1, line 30. Tagging model also described in detail in section 2. It is inherent that the model must be stored in a memory in order to enable the analyzer.);

a probability calculator for finding a probability that each said hypothesis will appear in a large corpus of text by using a weighted combination of the information for the part-of-speech n-gram models stored in the model storage facility (equations 3, 4 and 5 described in section 201 estimates the probabilities of the tagging with relation to the relative frequencies of the corresponding events.); and

a solution finder for finding a solution among said hypotheses, based on the probabilities generated by the probability calculator (Once word hypotheses for unknown words are generated, the proposed N-best algorithm will find the most likely word segmentation and part of speech assignment taking into account the entire sentence; page 204, column 1, line 22.)

8. Consider claim 13, A method of morphological analysis comprising (Japanese morphological analyzer, abstract):

applying a prescribed method of morphological analysis to a text and generating one or more hypotheses as candidate results of the morphological analysis, each hypothesis being a word string with part-of-speech tags, the part-of-speech tags including form information for parts of speech having forms (We propose a novel search strategy for getting the N best morphological analysis hypotheses for the input

sentence; page 201, column 1, line 35. We used the simple tri-POS model as the tagging model for Japanese; page 201, column 1, line 30.);

calculating probabilities that each said hypothesis will appear in a large corpus of text by using a weighted combination of a plurality of part-of-speech n-gram models, at least one of the part-of-speech n-gram models including information about forms of parts of speech (equations 3, 4 and 5 described in section 201 estimates the probabilities of the tagging with relation to the relative frequencies of the corresponding events.); and

finding a solution among said hypotheses, based on said probabilities (Once word hypotheses for unknown words are generated, the proposed N-best algorithm will find the most likely word segmentation and part of speech assignment taking into account the entire sentence; page 204, column 1, line 22.).

9. Consider claim 20, Nagata teaches a machine-readable medium storing a program comprising instructions that can be executed by a computing device to carry out morphological analysis by the method of claim 13 (Nagata teaches a morphological analyzer; abstract. In order to operate this analyzer it is inherent that there is in fact a storage medium containing the instructions in order to operate it.).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

12. Claims 2, 3, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata.

13. Consider claim 2, Nagata teaches the morphological analyzer of claim 1, but does not specifically teach wherein said at least one of the part-of-speech n-gram models including information about forms of parts of speech is a hierarchical part-of-speech n-gram model.

However Nagata's language model does suggest using hierarchical part-of-speech n-gram model as the model takes into account the frequency that a given word

is tagged a given part of speech; page 202, column 1, line 6. As one possible tag will have a higher value than another tag, then this model can be considered hierarchical.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to recognize that the morphological analyzer as taught by Nagata could be use a hierarchical speech model in order to provide a more accurate language model to the analyzer.

14. Consider claim 3, Nagata teaches the morphological analyzer of claim 2, wherein the hierarchical part-of-speech n-gram model calculates a product of a conditional probability $P(w_i | t_i)$ of occurrence of a word w_i given its part of speech t_i , a conditional probability $P(t_{i\text{form}} | t_{i\text{pos}})$ of occurrence of the part of speech $t_{i\text{pos}}$ of said word w_i in a form $t_{i\text{form}}$ shown by said word w_i , and a conditional probability $P(t_{i\text{Pos}} | t_{i-N+1}...t_{i-1})$ of occurrence of the part of speech $t_{i\text{pos}}$ of said word w_i following a part-of-speech tag string $t_{i-N+1}...t_{i-1}$ indicating parts of speech of $N - 1$ preceding words, where N is a positive integer (If we have some tagged text available, we can estimate the probabilities $P(t_{dti_2}, t_{i-1})$ and $P(w_i | t_i)$ by computing the relative frequencies of the corresponding events on this data:

$$P(t_i | t_{i-2}, t_{i-1}) = f(t_i | t_{i-2}, t_{i-1}) = \frac{N(t_{i-2}, t_{i-1}, t_i)}{N(t_{i-2}, t_{i-1})} \quad (3)$$

$$P(w_i | t_i) = f(w_i | t_i) = \frac{N(w, t)}{N(t)} \quad (4)$$

where f indicates the relative frequency, $N(w, t)$ is the number of times a given word w appears with tag t , and $N(t_{i-2}, t_{i-1}, t_i)$ is the number of times that sequence $t_{i-2} t_{i-1} t_i$ appears in the text. It is inevitable to suffer from sparse-data problem in the part of speech tag trigram probability; page 202, column 1.).

15. Consider claim 14, Nagata teaches method of claim 13, but does not specifically teach wherein said at least one of the part-of-speech n-gram models including information about forms of parts of speech is a hierarchical part-of-speech n-gram model.

However Nagata's language model does suggest using hierarchical part-of-speech n-gram model as the model takes into account the frequency that a given word is tagged a given part of speech; page 202, column 1, line 6. As one possible tag will have a higher value than another tag, then this model can be considered hierarchical.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to recognize that the morphological analyzer as taught by Nagata could be use a hierarchical speech model in order to provide a more accurate language model to the analyzer.

16. Consider claim 15, Nagata teaches the method of claim 14, wherein the hierarchical part-of-speech n-gram model calculates a product of a conditional probability $P(w_i | t_i)$ of occurrence of a word w_i given its part of speech t_i , a conditional probability $P(t_{iform} | t_{ipos})$ of occurrence of the part of speech t_{ipos} of said word w_i in a

form tiform shown by said word w_i , and a conditional probability $P(t_i|Pos \mid t_{i-N+1}...t_{i-1})$ of occurrence of the part of speech Pos of said word w_i following a part-of-speech tag string $t_{i-N+1}...t_{i-1}$ indicating parts of speech of $N - 1$ preceding words, where N is a positive integer (If we have some tagged text available, we can estimate the probabilities $P(t_{i-2}, t_{i-1})$ and $P(w_i|t_i)$ by computing the relative frequencies of the corresponding events on this data:

$$P(t_i|t_{i-2}, t_{i-1}) = f(t_i|t_{i-2}, t_{i-1}) = \frac{N(t_{i-2}, t_{i-1}, t_i)}{N(t_{i-2}, t_{i-1})} \quad (3)$$

$$P(w_i|t_i) = f(w_i|t_i) = \frac{N(w, t)}{N(t)} \quad (4)$$

where f indicates the relative frequency, $N(w, t)$ is the number of times a given word w appears with tag t , and $N(t_{i-2}, t_{i-1}, t_i)$ is the number of times that sequence $t_{i-2} t_{i-1} t_i$ appears in the text. It is inevitable to suffer from sparse-data problem in the part of speech tag trigram probability; page 202, column 1.).

17. Claims 4-7, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata in view of Pla et al (Improving Part-of-Speech Tagging using Lexicalized HMMs).

18. Consider claim 4, Nagata teaches the morphological analyzer of claim 1, but does not specifically teach wherein at least one of the part-of-speech n-gram models is a lexicalized part-of-speech n-gram model.

In the same field of part of speech tagging, Pla teaches at least one of the part-of-speech n-gram models is a lexicalized part-of-speech n-gram model (We introduce a simple method to build Lexicalized Hidden Markov models for improving precision of part-of-speech tagging; abstract.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to used lexicalized HMMs as taught by Pla with the analyzer of Nagata in order to improve tagging accuracy.

19. Consider claim 5, Pla teaches the morphological analyzer of claim 4, wherein the lexicalized part-of-speech n-gram model calculates a product of a conditional probability $P(w_i | t_i)$ of occurrence of a word w_i given its part of speech t_i and a conditional probability $P(t_i | W_{i-N+1}t_{i-N+1} \dots W_{i-1} t_{i-1})$ of occurrence of the part of speech t_i of said word w_i following $N - 1$ words $w_{i-N+1} w_{i-1}$ having respective parts of speech $t_{i-N+1} \dots t_{i-1}$, where N is a positive integer (Lexical probabilities $P(w_i|c_i)$ are calculated by dividing the frequency of the pair $\langle w_i, c_i \rangle$ by the frequency of the category c_i . Contextual probabilities for trigrams are estimated by dividing the frequency of the sequence $\langle c_{i-1}, c_{i-2} \rangle$ by the frequency of sequence $\langle c_{i-1}, c_{i-2} \rangle$; page 7 line 23.).

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20. Consider claim 6, Pla teaches the morphological analyzer of claim 4, wherein the lexicalized part-of-speech n-gram model calculates a conditional probability $P(w_i | t_{i-N+1} \dots t_{i-1})$ of occurrence of a word w_i having a part of speech t_i following a string of $N - 1$ parts of speech $t_{i-N+1} \dots t_{i-1}$, where N is a positive integer (Lexical probabilities $P(w_i | c_i)$ are calculated by dividing the frequency of the pair $\langle w_i, c_i \rangle$ by the frequency of the category c_i . Contextual probabilities for trigrams are estimated by dividing the frequency of the sequence $\langle c_i, c_{i-1}, c_{i-2} \rangle$ by the frequency of sequence $\langle c_{i-1}, c_{i-2} \rangle$; page 7 line 23).

21. Consider claim 7, Pla teaches the morphological analyzer of claim 4, wherein the lexicalized part-of-speech n-gram model calculates a conditional probability $P(w_i | w_{i-N+1} \dots w_{i-1} t_{i-N+1} \dots t_{i-1})$ of occurrence of a word w_i having a part of speech t_i following a string of $N - 1$ words $w_{i-N+1} \dots w_{i-1}$ having respective parts of speech $t_{i-N+1} \dots t_{i-1}$, where N is a positive integer (Lexical probabilities $P(w_i | c_i)$ are calculated by dividing the frequency of the pair $\langle w_i, c_i \rangle$ by the frequency of the category c_i . Contextual probabilities for trigrams are estimated by dividing the frequency of the sequence $\langle c_i, c_{i-1}, c_{i-2} \rangle$ by the frequency of sequence $\langle c_{i-1}, c_{i-2} \rangle$ page 7 line 23. For the model, each state will take into account the previous word and tag of the previous state.)

22. Consider claim 16, Nagata teaches the method of claim 13, but does not specifically teach wherein at least one of the part-of-speech n-gram models is a lexicalized part-of-speech n-gram model.

In the same field of part of speech tagging, Pla teaches at least one of the part-of-speech n-gram models is a lexicalized part-of-speech n-gram model (We introduce a simple method to build Lexicalized Hidden Markov models for improving precision of part-of-speech tagging; abstract.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to used lexicalized HMMs as taught by Pla with the analyzer of Nagata in order to improve tagging accuracy.

23. Claims 8 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata in view of Abrego et al (US PAP 2003/0046078).

24. Consider claim 8, Nagata teaches the morphological analyzer of claim 1, but does not specifically teach wherein at least one of the part-of-speech n-gram models stored in the model storage facility is a class part-of-speech n-gram model.

In the same field of n-gram language modeling, Abrego teaches at least one of the part-of-speech n-gram models stored in the model storage facility is a class part-of-speech n-gram model (It is important to notice that the resulting N-grams from the N-gram generator 18 are not word N-grams but instead class N-grams. The N-grams of valid classes 20 produces estimations of the probability that a class will follow its given history or sequence in an N-gram; i.e., how likely a sequence of classes are to be valid; paragraph 0038.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use class n-gram models as taught by Abrego for parsing as taught by Nagata in order to provide a more accurate part of speech analysis.

25. Consider claim 17, Nagata teaches the method of claim 13, but does not specifically teach wherein at least one of the part-of-speech n-gram models stored in the model storage facility is a class part-of-speech n-gram model.

In the same field of n-gram language modeling, Abrego teaches at least one of the part-of-speech n-gram models stored in the model storage facility is a class part-of-speech n-gram model (It is important to notice that the resulting N-grams from the N-gram generator 18 are not word N-grams but instead class N-grams. The N-grams of valid classes 20 produces estimations of the probability that a class will follow its given history or sequence in an N-gram; i.e., how likely a sequence of classes are to be valid; paragraph 0038.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use class n-gram models as taught by Abrego for parsing as taught by Nagata in order to provide a more accurate part of speech analysis.

26. Claim 9-11, and 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata and Abrego as applied to claim 8 above, and further in view of Pla et al.

27. Consider claim 9, Nagata and Abrego teaches the morphological analyzer of claim 8, but does not teach specifically wherein the class part-of-speech n-gram model calculates a product of a conditional probability $P(w_i | t_i)$ of occurrence of a word w_i given its part of speech t_i and a conditional probability $P(t_i | C_{i-N+1} t_{i-N+1} \dots C_{i-1} t_{i-1})$ of occurrence of said part of speech t_i following a string of $N - 1$ words assigned to respective classes $C_{i-N+1} \dots C_{i-1}$ with respective parts of speech $t_{i-N+1} \dots t_{i-1}$, where N is a positive integer.

In the same field of tagging, Pla teaches lexical part-of-speech n-gram model calculates a product of a conditional probability $P(w_i | t_i)$ of occurrence of a word w_i given its part of speech t_i and a conditional probability $P(t_i | C_{i-N+1} t_{i-N+1} \dots C_{i-1} t_{i-1})$ of occurrence of said part of speech t_i following a string of $N - 1$ words assigned to respective classes $C_{i-N+1} \dots C_{i-1}$ with respective parts of speech $t_{i-N+1} \dots t_{i-1}$, where N is a positive integer (Lexical probabilities $P(w_i | c_i)$ are calculated by dividing the frequency of the pair $\langle w_i, c_i \rangle$ by the frequency of the category c_i . Contextual probabilities for trigrams are estimated by dividing the frequency of the sequence $\langle c_i, c_{i-1}, c_{i-2} \rangle$ by the frequency of sequence $\langle c_{i-1}, c_{i-2} \rangle$; page 7 line 23).

Therefore it would have been obvious to apply the same rules of lexical tagging to the class tagger of Nagata and Abrego in order to provide a more accurate tagging, taking fully into consideration the class of which the words belong.

28. Consider claim 10, Nagata and Abrego teaches the morphological analyzer of claim 8, but does not specifically teach wherein the class part-of-speech n-gram model

calculates a product of a conditional probability $P(w_i | C_{i-N+1} t_{i-N+1} \dots C_{i-1} t_{i-1})$ of occurrence of a word w_i having a part of speech t_i following a string of $N - 1$ words in respective classes $C_{i-N+1} \dots C_{i-1}$ With respective parts of speech $t_{i-N+1} \dots t_{i-1}$, where N is a positive integer.

In the same field of tagging, Pla teaches wherein the lexical part-of-speech n-gram model calculates a product of a conditional probability $P(w_i | C_{i-N+1} t_{i-N+1} \dots C_{i-1} t_{i-1})$ of occurrence of a word w_i having a part of speech t_i following a string of $N - 1$ words in respective words $C_{i-N+1} \dots C_{i-1}$ With respective parts of speech $t_{i-N+1} \dots t_{i-1}$, where N is a positive integer (Lexical probabilities $P(w_i | c_i)$ are calculated by dividing the frequency of the pair $\langle w_i, c_i \rangle$ by the frequency of the category c_i . Contextual probabilities for trigrams are estimated by dividing the frequency of the sequence $\langle c_{i-1}, c_i, c_{i-2} \rangle$ by the frequency of sequence $\langle c_{i-1}, c_{i-2} \rangle$; page 7 line 23 For the model, each state will take into account the previous word and tag of the previous state.)

Therefore it would have been obvious to apply the same rules of lexical tagging to the class tagger of Nagata and Abrego in order to provide a more accurate tagging, taking fully into consideration the class of which the words belong.

29. Consider claim 11, Nagata and Abrego teaches the morphological analyzer of claim 8, but does not specifically teach wherein the class part-of-speech n-gram model is trained from both a part-of-speech tagged corpus and a part-of-speech untagged corpus.

In the same field of n-gram models, Pla teaches the class part-of-speech n-gram model is trained from both a part-of-speech tagged corpus and a part-of-speech untagged corpus (The learning process of the parameters can be carried out from labeled corpora or an unlabelled corpus; page 7, line 15.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine learning method of Pla with the analyzer of Abrego and Nagata in order to allow for a more robust final model after training.

30. Consider claim 18, Nagata and Abrego teaches method of claim 17, but does not specifically teach wherein the class part-of-speech n-gram model is trained from both a part-of-speech tagged corpus and a part-of-speech untagged corpus.

In the same field of n-gram models, Pla teaches the class part-of-speech n-gram model is trained from both a part-of-speech tagged corpus and a part-of-speech untagged corpus (The learning process of the parameters can be carried out from labeled corpora or an unlabelled corpus; page 7, line 15.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine learning method of Pla with the analyzer of Abrego and Nagata in order to allow for a more robust final model after training.

31. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagata in view of Siu (Variable N-Grams and Extensions for Conversational Speech Modeling).

32. Consider claim 12, Nagata teaches the morphological analyzer of claim 1, but does not specifically teach further comprising a weight calculation unit using a leave-one-out method to calculate weights of the part-of-speech n-gram models.

In the same field of part of speech tagging, Siu teaches a weight calculation unit using a leave-one-out method to calculate weights of the part-of-speech n-gram models (To evaluate the effect of node pruning and merging on unseen data, we use leave-one-out (LOO) likelihood to estimate the distributions used in the distance measures; column 69, column 2, section B.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the leave one out method as taught by Siu with the analyzer of Nagata in order to provide a more robust method of training.

33. Consider claim 19, Nagata teaches the method of claim 13, but does not specifically teach further comprising a weight calculation unit using a leave-one-out method to calculate weights of the part-of-speech n-gram models.

In the same field of part of speech tagging, Siu teaches a weight calculation unit using a leave-one-out method to calculate weights of the part-of-speech n-gram models (To evaluate the effect of node pruning and merging on unseen data, we use leave-one-out (LOO) likelihood to estimate the distributions used in the distance measures; column 69, column 2, section B.).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to use the leave one out method as taught by Siu with the analyzer of Nagata in order to provide a more robust method of training.

Conclusion

34. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure is listed on the Notice of References Cited.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas C. Godbold whose telephone number is (571) 270-1451. The examiner can normally be reached on Monday-Thursday 7:00am-4:30pm Friday 7:00am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DCG



PATRICK N. EDOUARD
SUPERVISORY PATENT EXAMINER